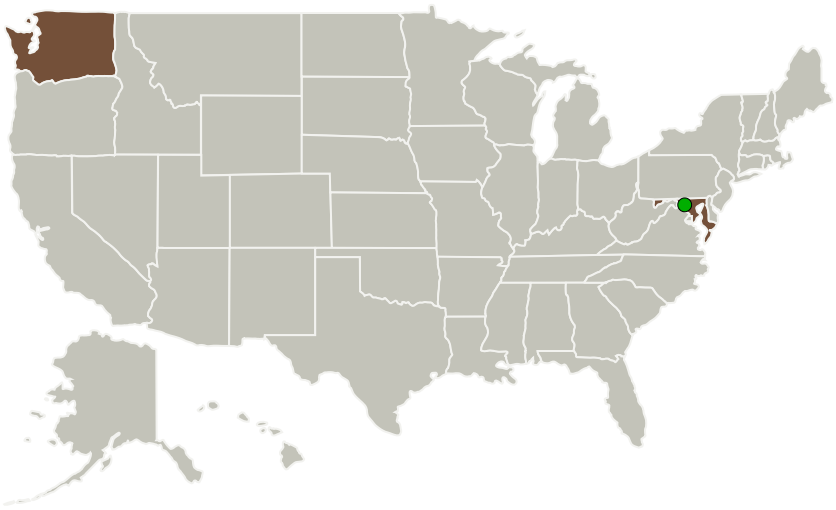
RF Crosslink for Relative Navigation and Time/Frequency Distribution, Phase I

Completed Technology Project (2016 - 2016)

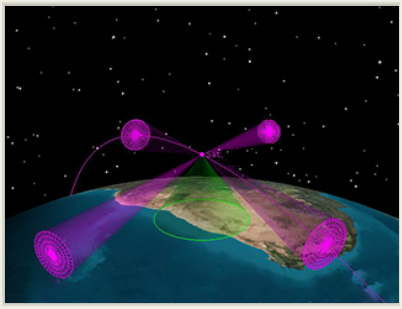
Project Introduction

M42 Technologies proposes to develop a RF based crosslink with relative navigation and time transfer capabilities to enable autonomous precision formation flying (PFF) of spacecraft as small as nanosatellites (1 to 10 kg). The solution consists of a multi-channel software defined radio (SDR), small aperture antenna and innovative signaling and processing to enable CubeSat scaled spacecraft to measure positions with millimeter-level precision positioning thereby providing new capabilities such as autonomous rendezvous and docking (AR&D), and precision formation flying (PFF) both for human and robotic exploration missions. To improve navigation, the system also distributes time and frequency to enable cooperative and collaborative space science missions.

Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
M42 Technologies, LLC	Lead Organization	Industry	Seattle, Washington
Goddard Space Flight Center(GSFC)	Supporting Organization	NASA Center	Greenbelt, Maryland



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Primary U.S. Work Locations	
Maryland	Washington

Project Transitions

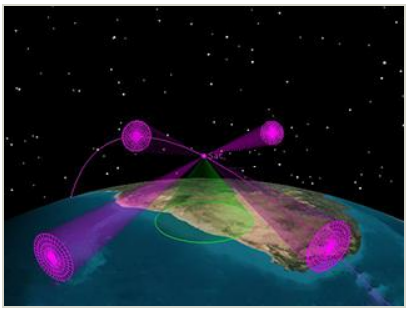
June 2016: Project Start

December 2016: Closed out

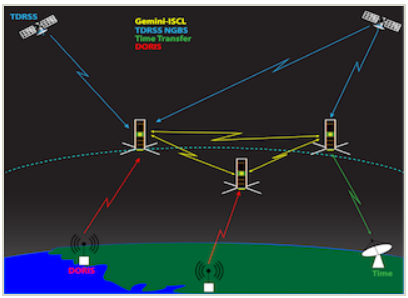
Closeout Documentation:

- Final Summary Chart*(https://techport.nasa.gov/file/139785)*

Images



Briefing Chart Image
RF Crosslink for Relative Navigation and Time/Frequency Distribution, Phase I
(https://techport.nasa.gov/image/131153)



Final Summary Chart Image
RF Crosslink for Relative Navigation and Time/Frequency Distribution, Phase I Project Image
(https://techport.nasa.gov/image/126760)

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

M42 Technologies, LLC

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

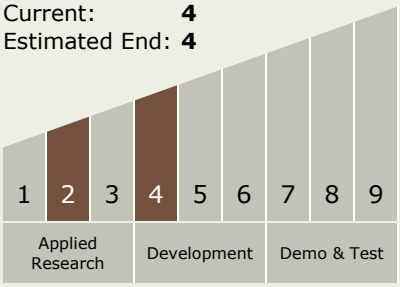
Carlos Torrez

Principal Investigator:

Nestor Voronka

Technology Maturity (TRL)

Start: **2**
Current: **4**
Estimated End: **4**



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Completed Technology Project (2016 - 2016)

Technology Areas

Primary:

- TX05 Communications, Navigation, and Orbital Debris Tracking and Characterization Systems
  - TX05.2 Radio Frequency
    - TX05.2.4 Flight and Ground Systems

Target Destinations

The Moon, Mars, Outside the Solar System, The Sun, Earth, Others Inside the Solar System